

CADUCEUS

*a museum quarterly
for the health sciences*



Autumn 1986

**Caduceus:
a museum
quarterly for
the health
sciences**

Volume II • Number 3 • Autumn 1986

Published by the
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Humanities

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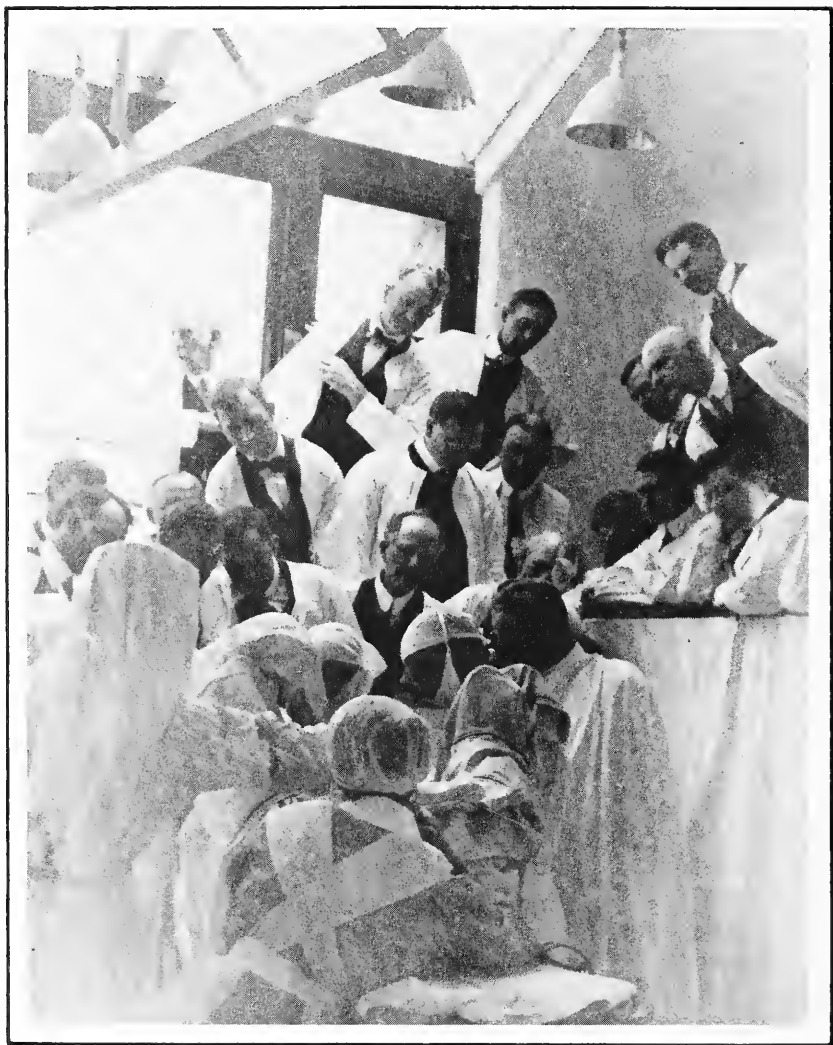
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*Modern Surgery and the
Development of Group Practice
in the Midwest*

by Dale C. Smith



Charles H. Mayo lecturing during an operation at St. Mary's Hospital, Rochester, Minnesota in 1913, illustrating the full development of aseptic surgery. (Photo courtesy of the National Library of Medicine.)

*Modern Surgery and the Development of Group Practice in the Midwest**

by Dale C. Smith

Group practice, the association of several physicians to provide care collectively for patients, sharing capital investment and practice revenues, has become a common feature of the health care system in late twentieth-century America. Since the end of the second World War, group practice in a variety of forms has grown dramatically: in 1946 there were 368 groups, by 1969 there were 6,371, in 1980, 10,762 and today there are even more. Some group practices are limited to a single specialty and some to the general or family practice, but traditionally a group practice provides care in two or more specialties and incorporates professional, non medical, business management such that the physician and patient have only an indirect financial relationship.¹

Despite its success in today's medical marketplace, group practice has had a very irregular history, illustrative of many facets of American medicine in the twentieth century. Such practices are vitally involved in prepaid medical care plans—the health maintenance organizations. It was in opposition to group practice that organized medicine (the District of Columbia Medical Society and through it the American Medical Association) early attracted the attention of federal antitrust attorneys and in 1943 was found by the Supreme Court to be in violation of the Sherman Antitrust Act.² In 1932 the Committee on the Cost of Medical Care Majority Report was rejected by the American Medical Association (AMA),

*This work was supported by the Uniformed Services University of the Health Sciences. The opinions or assertions herein are the private ones of the author and are not to be construed as official or reflecting the views of the Department of Defense or the Uniformed Services University of the Health Sciences.

in large measure over the issue of group practice, particularly prepaid group practice. Before the Depression there seemed to have been no limit and little organized opposition to the group practice concept, particularly in the 1920s. The opposition, as it emerged, was opposition to salaried practitioners and prepaid health care. Even several presidents of the AMA were members of group practices. Groups established in the first half of the century still dominate the popular mind, notably the Cleveland Clinic and the Mayo Clinic.

While group practice has become a national phenomena in recent years, single specialty or general practice groups increasingly have outnumbered the classic multi-specialty group. In mid-America, however, the traditional multi-specialty group remains a much more vital form of medical practice; of almost three thousand multi-specialty group practices in the nation in 1975, over 900 were in the upper Mississippi Valley.³ What forces drove the creation and helped to preserve these multi-specialty groups? If one looks at the foundation and, more importantly, at the founders of the groups which, in the first quarter of the century, provided the models for the profession, some possible answers appear. In addition to the coming of the railroad, which greatly changed rural living patterns in mid-America, other important factors were the growth of medical knowledge, the increasing role of the modern hospital, and the increase of specialization. Probably the single most important factor, though, was the phenomenal success of modern aseptic surgery in treating patients with a wide variety of diseases. Physicians increasingly devoted their time and energies to surgery, giving up other aspects of practice. In the urban centers and in the East, where population density was greater, surgeons could work as specialty consultants for patients referred by their primary care physicians. In the Midwest, however, the patterns of life suggested that other arrangements might be more advantageous.

Before exploring the origins of Midwestern group practices in any detail, it is helpful to examine the transformation of surgery as it affected the lives of physicians and their patients. The Civil War was certainly a boon to the specialty of surgery, as it was for many aspects of American life. Before the war, most American doctors had seen little major surgery and had done even less. For many, significant surgery had consisted of bleeding, bandaging, minor

trauma and fractures, the lancing of an abscess, and occasional removal of superficial growths of various kinds. In major hospitals such as the Massachusetts General Hospital, these operations were rare by modern standards and the surgeon's repertoire remained limited. Extant statistics show an average of about one and one-half operations per week during the generation following the introduction of ether; these operations included amputations, compression for aneurysms, arterial ligations, bladder operations, excisions of cancers of various types, castrations, and orthopedic operations for club foot.⁴ The trauma of the war exposed many more physicians to the need for major operations, particularly amputations, as well as to the difficulties of postoperative management of the surgical patient. Following the 1862 Fredericksburg Campaign, there were 9,600 wounded soldiers, with 906 amputations and 56 resections performed on the Union side alone. In the same conflict there were only four abdominal and three head operations.⁵ The Union Army enrolled 12,343 medical officers during the conflict (although that number counts many physicians more than once), while the Confederacy had almost 3,000 physicians in uniform and an unknown number of civilians under contract.⁶

In addition to the vastly increased exposure of American practitioners to the need for surgery during the War, the 1860s marked other important changes. As the transcontinental railroad was completed and a multitude of settlers moved into the Great Plains states, the Midwest emerged as an important place for new immigrants to establish farms and raise the produce necessary to feed the nation. It is my belief that the patterns of settlement and trade which emerged as a result of railroad expansion explain the particular development of group practice in the Midwest. It is important to remember, however, that the necessary precondition for this development was a revolution in the medical sciences which transformed surgery itself.

Among the developments which were to have a profound and far reaching impact on medicine and surgery was the emergence of experimental physiology and pathology. More important, though, was the most dramatic and immediate change which resulted from the development of the germ theory. Acceptance of the germ theory was particularly important for the development of surgery since it offered a rational explanation of postoperative infection which



Edmund Andrews, M.D. (1824-1904) A Chicago surgeon and early advocate of Lister's antiseptic system of surgery. (Photo courtesy of the National Library of Medicine.)

could be evaluated both empirically and experimentally. Louis Pasteur's germ theory, stemming from the spontaneous generation controversies, stressed the role of germs in the air and the ways in which they could be destroyed. Joseph Lister, a Scottish surgeon who became aware of Pasteur's theory, developed an empirical test—antiseptic surgery—in which he used chemicals to destroy the germs which infected traumatic and surgical wounds. Lister's 1867 paper stressed the use of antiseptics—in the first cases, carbolic acid—to destroy the germs in wounds. That he clearly saw beyond a new form of wound treatment was indicated by the short section of a paper on abscesses in which he wrote: "the essential object is to guard against the introduction of living particles from without."⁷

Unfortunately, most surgeons used Lister's paper as the introduction of a new type of dressing—one soaked in carbolic acid—rather than as a theoretical change in surgical practice. His title itself encouraged such an interpretation. The successful Listerians were those who understood the scientific underpinnings of the system—the goal was to destroy germs, particularly atmospheric germs, believed to cause postoperative infection—mastery of technique was of secondary importance.

Slowly the results of antiseptic procedures began to have an impact, but the limits of antiseptic surgery became apparent even more quickly. Some surgeons who were strongly opposed to Lister's methods could expect results as good as the Listerian surgeon. The chief counterexample was Englishman Lawson Tait, who stressed cleanliness in his operations. When Lister spoke at the 1876 International Medical Congress in Philadelphia, many American surgeons claimed their results were as good as his without antiseptics. In fact, many frankly disbelieved the germ theory.⁸

Of the early Listerians in mid-America, none was more influential than Edmund Andrews, professor of surgery at the Chicago Medical College. Andrews reported the successful use of carbolic acid dressings in the treatment of compound fractures and other wounds in 1869 and argued that Lister had "revolutionized certain branches of surgery."⁹ The qualification of the word "certain" in Dr. Andrew's statement was an important one, and one which in retrospect tends to be forgotten, Listerian antiseptics, as valuable as it was, actually was a very limited practical advance. The strong

antiseptics used by Lister were dangerous physiologically and the system was not effective enough to warrant elective opening of uninfected body cavities. St. Clair Thompson, one of Lister's students, later recalled that "in Lister's day, the abdomen and the chest . . . were sacrosanct spaces, and he did not invade them."¹⁰

The empirical progress of antiseptics was supplemented in the 1870s by progress in experimental bacteriology. With increasing scientific knowledge of the nature of germs, the antiseptic approximation of Lister gave way slowly to a new philosophy of surgical asepsis. In 1878 Robert Koch published his classic work on traumatic infections. Through careful technique, particularly the innovative use of differential staining, Koch was able to demonstrate that there were different organisms which were constantly associated with wound infections and that for each organism the symptoms and anatomical lesions were specific and constant. While not the complete proof Koch had desired, the 1878 work was strongly suggestive and convinced many surgeons of the importance of excluding pathogenic germs from wounds. Furthermore, Koch established that heat sterilization was far more effective than any chemical disinfectant available.¹¹

At the 1878 meeting of the Illinois State Medical Society, Edmond Andrews spoke of the importance of eliminating bacteria in surgery; the full and careful use of the antiseptic methods was, in his opinion, the best means of doing so. David Prince of Jacksonville, Illinois, supported Andrews and called attention to the role of heat in destroying bacteria which could not be killed by chemicals. He advocated repeated boiling of instruments and suggested that wounds should be kept immersed in heat sterilized, warm water (110°).¹² (A careful reading of the surgical literature reveals that while the term remained *antiseptic* surgery, the surgeons of the late 1870s and 1880s increasingly were approximating aseptic surgical technique.) As with this case in Illinois, innovative practitioners in other Midwestern states repeatedly reported good results with antiseptics and urged their colleagues to pursue clean surgery. In Wisconsin the state medical society's committee on surgery reported on the use of carbolic acid as early as 1870 and by 1881 Nicholas Senn of Milwaukee spoke to his surgical colleagues of a "complete revolution in surgery." The progress of urban surgeons in Milwaukee or Chicago, however, was not necessarily followed by rapid conversion of general



An operation demonstrating early antiseptic procedures in the United States. This particular photo was taken at Bellevue Hospital in New York, ca. 1880, but just as easily could have been taken in a busy operating room in a city in the Midwest. (Photo courtesy of the National Library of Medicine.)

practitioners in rural areas. The equipment for antiseptics was difficult to manage in house calls and its value outside of the germ-laden environment of urban hospitals had not been demonstrated convincingly to many general practitioners.¹³ The editor of the *Detroit Lancet* argued as late as 1878 that antiseptic technique was "not necessary to complete success in private practice," and the Ann Arbor Medical and Surgical Society in that same year held a discussion on "the germ theory and its bearing on practice."¹⁴ Yet among the self-selected group of practitioners who were increasingly identifying themselves as surgeons, the empirical results of Listerian methods and the experimental support of the bacteriologists was having an impact. In the surgical section of the Illinois State Medical Society in 1880, all speakers approved of the use of carbolic acid.¹⁵

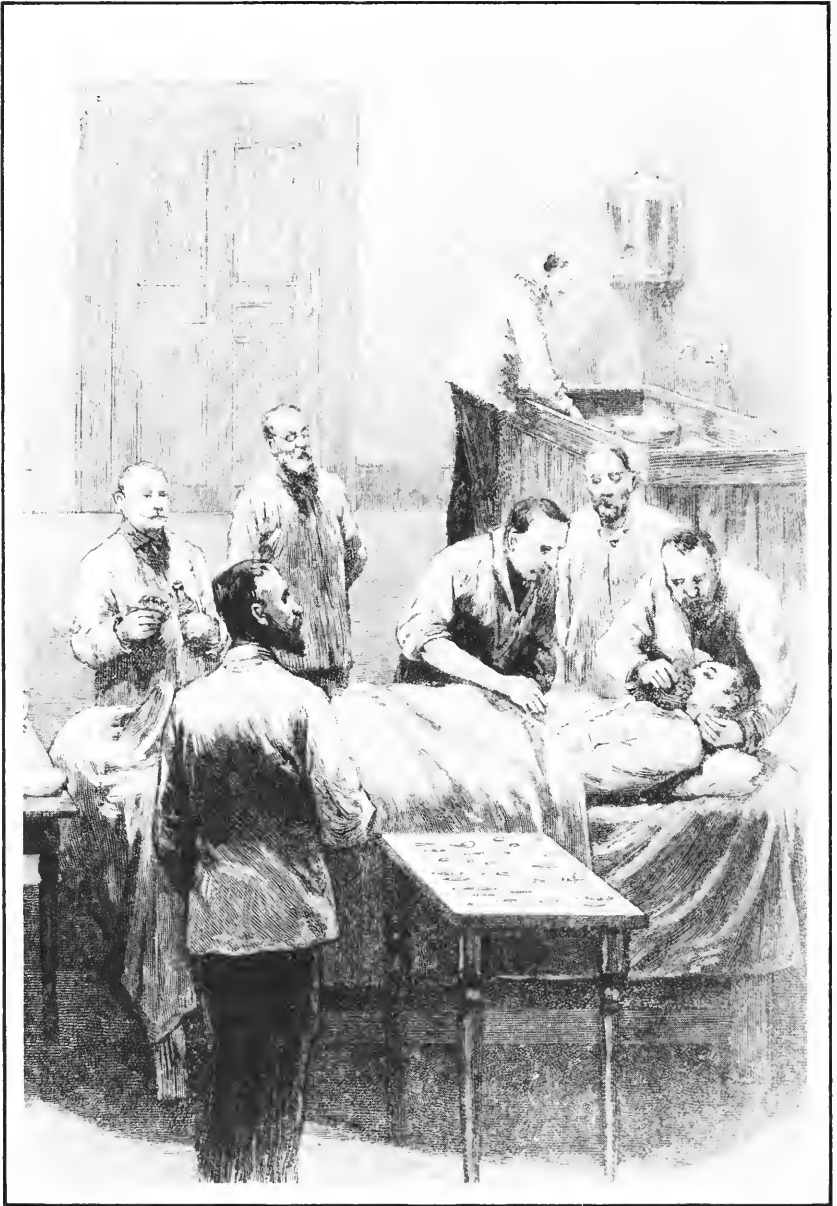
As American surgeons were working to convince their colleagues of the value of the germ theory in surgery, progress was continuing in Europe. As bacteriological technique progressed in the 1880s, the challenge to surgeons was to prevent contamination of surgical wounds by these organisms. When it was ascertained that the chief sources of pathogenic organisms were the operators and their instruments, attention quickly turned in the 1880s from the air to the surgeon as the source of infection. Although the shift from antiseptics to asepsis was gradual, two German surgeons are generally given credit. In 1884 Gustav Neuber introduced the use of clean aprons, boot covers and caps in his private surgical clinic in an effort to reduce the chances of contamination from the surgical team. He later dropped the cap from the routine. After two years he reported his results—vastly reduced postoperative infection rates.¹⁶ In 1886, probably independently, Ernest Bergmann introduced the use of heat sterilized gowns for all members of the surgical team. He also advocated the use of steam sterilized instruments, a marked improvement over the chemical sterilization of the antiseptic era. Bergmann, professor of surgery in Berlin, had a direct impact on large numbers of students and visiting surgeons; his assistants became professors in other universities and the new philosophy of surgical cleanliness—asepsis—increasingly displaced the antiseptic dressings and chemical disinfectant sprays and washes of Listerism of the 1870s and early 1880s.¹⁷

In the 1880s, as surgery increasingly became a safe therapeutic option, the specialty of surgery began to take a more definite shape in America. Socially, this took the form of organizations and journals devoted to surgery, as well as a few practitioners who for the first time began to limit their practices to surgical cases. Scientifically, the safety of surgical intervention and an increasing number of people devoting their time to surgery resulted in rapid expansion in the number and kind of surgical procedures; by one estimate over one hundred new procedures were introduced world wide between 1880 and 1890.¹⁸ Both changes were essential prerequisites for the emergence of group practice.

Specialization evolved slowly and was a controversial aspect of American medical practice in the last third of the nineteenth and first third of the twentieth centuries. Specialization depended on both concentration of population—there had to be enough patients close enough to keep the specialist occupied full time at the specialty—and upon the specialty practitioners having a sufficient body of knowledge and repertoire of techniques to justify referrals from the general practitioner. As early as an 1868 issue of *The Atlantic Monthly*, one finds that an article entitled “Wonder of Modern Surgery” is based on achievements prior to the development of antiseptics and asepsis. These surgical achievements occurred primarily in the surgical subspecialties.

Specialists organized in terms of common interests and development: The American Ophthalmological Society in 1864, the American Otological Society in 1867, the American Dermatological Association in 1876, and the American Laryngological Association in 1879. Although general surgery remained the province of general practitioners, there were surgical sections or committees of most state medical societies and the American Medical Association (AMA).

At the 1879 meeting of the AMA, Samuel David Gross, the dean of American surgeons, began to explore the possibilities of organizing an American Surgical Society. Several of his colleagues objected on the grounds that the surgical section of the AMA was well respected and currently meeting the scientific needs of the generalist, but behind the scenes, Gross persisted. With four colleagues, William T. Briggs of Nashville, William W. Dawson of



An operation at Massachusetts General Hospital in 1889 showing the slow progress of aseptic surgery—there are no caps, masks or gloves in use, but the carbolic spray is gone. (Photo taken from Harper's Weekly of 1889, courtesy of the National Library of Medicine.)

Cincinnati, Moses Gunn of Chicago and Louis Dugas of Augusta, Gross issued a circular letter inviting distinguished surgeons to meet following the 1880 annual meeting of the AMA in New York. A small group of forty-four surgeons attended and organized the American Surgical Society, which in 1881 changed its name to the American Surgical Association (ASA). Midwesterners were well represented in this group of America's premier surgeons. Included in addition to Drs. Gunn and Dawson were John Hodgen of St. Louis, Phineas S. Conner of Cincinnati, Salen Marks of Milwaukee, and the first secretary of the new society, Jacob R. Weist of Richmond, Indiana.

The *Transactions of the American Surgical Association* reflect the discussions and debate about the emergence of surgery as seen by American's leading surgeons and they provided an annual accumulation of new knowledge. In these published discussions of the Association one can trace the development of new techniques and the growth of surgical pathology.¹⁹

The annual volume, though, despite its virtues and value, was insufficient to meet the needs of a rapidly developing field. Consequently, local specialist organizations and specialty journalism began to emerge. Three American cities were large enough to maintain surgical organizations in 1880—Philadelphia, Brooklyn and New York. The Brooklyn Anatomical and Surgical Society began publishing its *Proceedings* and in 1879 employed a young surgeon, Lewis Pilcher, to assist with editorial affairs. In 1881 the society sold the journal to Pilcher, who attempted to maintain it as a proprietary venture. From 1881 to 1884 Pilcher tried to meet the needs of the Society and produce a paying journal which was called the *Annals of Anatomy and Surgery*, but publication was suspended in 1884 for reorganization. In January 1885 the first issue of America's first uniquely surgical journal, the *Annals of Surgery*, appeared under Pilcher's direction. Many of the memoirs presented at the annual meetings of the American Surgical Association began to appear in the *Annals of Surgery*, as did the proceedings of the Eastern city societies. Surgeons without a substantial group of conferees began to depend upon the *Annals* for knowledge and professional encouragement. In the Midwest the *Annals of Surgery* was repeatedly referred to at state and local medical meetings, papers in it were sources of professional pride, and the information it contained was frequently considered worthy

of republication so that all practitioners could take advantage of it.²⁰

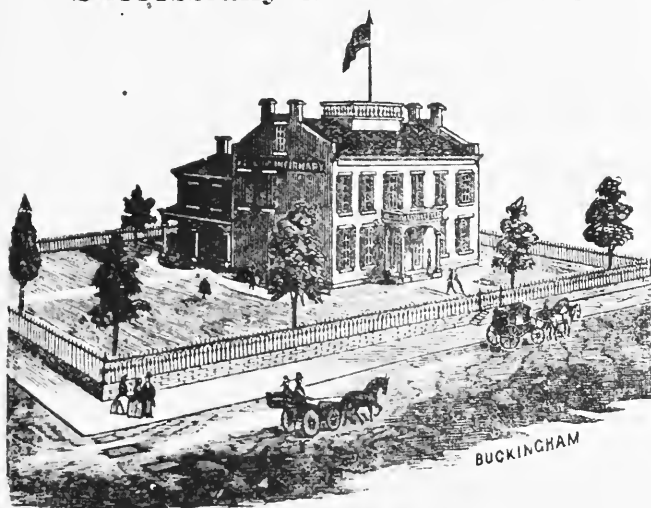
As important as organization and communication were to the emerging specialists, the numerous advances in surgery were really the *sine qua non* of specialization. The growth of surgery as a specialty is well illustrated by the simple change in numbers of operations performed over the course of the late nineteenth century, for with the advent of the new surgery, there were great changes in type and number of procedures. Recognizing that cities were growing and that all the cases were not strictly comparable, the following numbers collected by William Halsted in 1904 at least suggest the nature of the change.²¹

Hospital	Operations in 1878	Cases/Year	Cases/Year	
		1880s	1890s	1903
Massachusetts General	—	1,012	2,206	3,109
Boston City	316	588	1,627	1,923
Roosevelt	132	406	1,818	2,719
New York	142	271	1,300	1,680

Although the new surgical techniques obviously were dependent in large measure upon the ability of aseptic surgeons to invade the body cavities safely, they also were heavily dependent upon advances in the basic sciences of physiology and pathology. While there are numerous possible examples to illustrate the importance of science in the development of surgery, three will suffice—surgery of the thyroid because it was an important Midwestern medical/surgical problem; appendicitis, since it was such a uniquely American contribution to the new surgery; and cerebral surgery because it illustrates the importance of the new patterns of consultation and referral.

Goiter, as a tumorous swelling of the thyroid, was described by Fabricius in the Renaissance; exophthalmic goiter was recognized as a distinct clinic entity early in the nineteenth century, and the use of iodine to treat goiters was as old as rational medicine, waxing and waning with need and therapeutic fashion. There were numerous well documented attempts and several successful thyroidectomies from at least the mid-eighteenth century, but the operation was not a common therapy; surgeons usually reported series of only two or three cases. In operations for goiter, as in so

DESCRIPTION
OF
A Tumor on a Man's Side.
OF EXTRAORDINARY SIZE,
Successfully Removed at the



KEOKUK INFIRMARY,

TOGETHER WITH

STATISTICAL STATEMENT OF 360 OPERATIONS FOR TUMORS,
AND REPORT ON DISEASES OF THE EYE, BY

J. F. SANFORD, M.D., LL.D.

KEOKUK, IOWA:

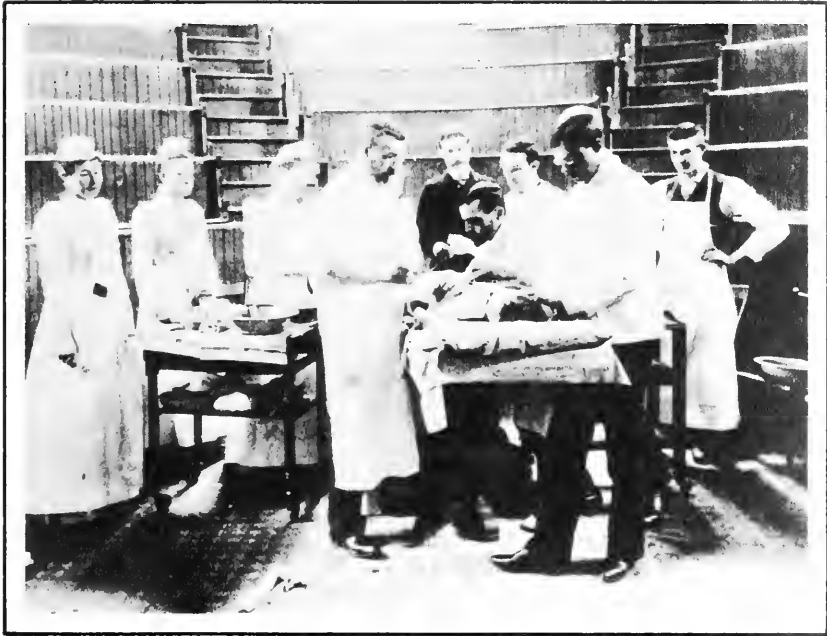
PRINTED AT DAILY GAIL CITY BOOK AND JOB ROOMS.
1866.

Advertisement of the Keokuk Infirmary in 1866. (Photo courtesy of The Pearson Museum.)

many surgical techniques, surgeons of the last third of the nineteenth century were led by Theodor Billroth. Between 1860 and 1876 Billroth performed 36 goiter operations with 36 percent mortality; after he adopted asepsis he did forty-eight more but his mortality rate for the second series dropped to less than 9 percent.

While Billroth and other surgeons were developing the operative technique, internists and physiologists were working on the relationships between the thyroid and the symptom complex associated with cretinism named *myxoedema* by William Ord. In the 1890s thyroid transplantation and injected thyroid extract were introduced and the physiologist Adolf Magnus-Levy studied the increased metabolic rate associated with toxic goiter. Surgeons were able to apply these advances in knowledge and with the accompanying changes in medical support of the patient, thyroid surgery increasingly became safer and more effective.²²

The impact of physiology on medical practice was even clearer in the case of the new cerebral surgery of the late nineteenth century. The investigations of John Hughlings Jackson, Paul Broca, and the other founders of modern neurology began the creation of a special field of medicine in which diagnostic sophistication increased rapidly. In the late 1870s David Ferrier's classic research on cerebral localization in dogs and monkeys provided the diagnostic neurologist with a much broader understanding of the phenomena they were observing clinically.²³ Thus as the new, safer surgery developed in the 1880s, a natural collaboration of neurologist and surgeon was anticipated. In 1884 neurologist A. H. Bennett diagnosed a patient with a probable cerebral tumor and invited Rickman Godlee, a Lister student, to operate for removal of the tumor. The operation was performed, the tumor was found where Bennett had predicted it would be and it was successfully removed. The patient died on the twenty-eighth postoperative day but the case was considered the first successful operation for brain tumor.²⁴ A similar pattern of collaboration, consultation, and referral was established at the National Hospital, Queen Square, London, between neurologists/physiologists William Gowers and David Ferrier and the surgeon/physiologist Victor Horsely in the mid 1880s. From that beginning most cerebral surgery of the late nineteenth century took its origins.²⁵



Surgical amphitheatre and operation in progress at St. Vincent's Charity Hospital, ca. 1890. (Photo courtesy of the Historical Division of the Cleveland Health Sciences Library.)

The same pattern established by the British pioneers was adopted in America in the late 1880s and 1890s. In 1892 Landon C. Gray addressed the Southern Surgical Association on cerebral surgery and pointed to the importance of collaboration with the statement: "There is no man I know of in the civilized world who is at once a master of surgery and neurology. It is idle to discuss whether there can be such a man. Suffice it to say that the necessities of medical practice have no where called for such a one, even in the great capitals of this country and of Europe."²⁶

As advances in physiology and pathology contributed to thyroid surgery and cerebral localization and new consultation patterns reflected the limits of the education of both diagnosticians and surgeons, so advances in pathology and improvements in the education of practitioners were crucial to understanding appendicitis. As with many diseases, there are case reports identifiable as appendicitis in early modern medical literature. In fact, the first recorded appendectomy took place in the eighteenth century. Although pathologists were identifying diseases of the appendix with increasing frequency by the middle of the nineteenth century, clinically these diseases were associated with the more general condition called perityphlitis—inflammation around or near the cecum. Surgeons slowly began to assist nature by draining perityphlitic abscesses.

Clarification came in 1886 when Reginald Heber Fitz, a Boston pathologist and student of Rudolf Virchow and Julius Friedrich Cohnheim, defined the disease *appendicitis*.²⁷ In addition to the major contribution to pathology, Fitz's 1886 paper helped define relationships between emerging specialists in surgery, general practice and pathology. Fitz called for practitioners to recognize their limits and call in the expertise of surgeons before it was too late. He warned surgeons to follow the natural history of disease and the subsequent course of their patients to be sure any intervention had the desired result.

The process of education advanced in the late 1880s and 1890s. In support of their new responsibilities and with new therapeutic opportunities, surgeons rapidly improved their diagnostic and technical skills. In 1888 Nicholas Senn in Wisconsin advocated early operation and urged surgeons to use Lambert's suture in the peritoneum to ensure proper healing. In 1889 Charles McBurney of



The Doctors Mayo. Seated is Dr. William Warrall Mayo and standing, left to right, are Dr. Charles H. Mayo and Dr. William J. Mayo. (Photo courtesy of Mayo Foundation.)

New York defined his point of pain as a diagnostic aid. In the 1890s Lewis L. McArthur of Chicago and Charles McBurney both advanced the idea of a gridiron muscle splitting incision. Even though it was rapidly becoming clear that the surgical approach to appendicitis was the optimal approach, there remained important questions over timing the operation.²⁸ Midwestern surgeons John B. Murphy and Albert J. Oschner of Chicago were in the forefront of surgical progress in appendicitis, as was a young surgeon in Rochester, Minnesota named William J. Mayo, who as early as 1888 published his first paper on early appendectomies.²⁹

William Mayo and his younger brother Charles were critical proponents for the emergence of modern surgery and the development of group practice. Their father, William W. Mayo, Sr., had established a five-state reputation as a consulting surgeon before his sons entered the profession. The senior Mayo had begun to perform some of the risky but necessary gynecological surgery which developed following Ephraim McDowell's first ovariectomy in 1809. When young William returned to enter practice with his father after graduating from the University of Michigan, it was only a question of time before he entered the arena as a surgical consultant. Charles, who had been educated in Chicago, came under the influence of Christian Fenger, the Danish surgeon-pathologist who brought scientific surgery to the Midwest. Fenger was an impressive teacher and William made postgraduate trips to Chicago to study with him. Murphy, Oschner, Senn and other young practitioners all profited from Fenger's instruction and in an urban setting such men had little difficulty following their chosen specialty. The Chicago Surgical Society was established on the Eastern model in 1900. In a rural setting like Rochester, the young Mayos and their father were actually general practitioners who served as surgical consultants for their colleagues.³⁰

Most American physicians known as surgeons were really general practitioners who had more than average surgical training and skill. There were no full-time surgeons in America for the first century of the nation's existence. Out of such relationships grew the idea of specialist surgeons. Although most of these were at best part-time specialists in the nineteenth century, slowly some developed full-time surgical practices in cities. In small towns there were simply not enough people to generate sufficient surgical cases for a practitioner to limit his practice.

The developments of the 1880s and 1890s expanded what would come to be called the surgeon's catchment area. While surgical care for trauma required immediate care, the Civil War had demonstrated the possibility of delayed amputation and had begun to stretch out the possibilities of surgical therapy. An ovariectomy could be delayed for some time, while the acute abdomen (if treated with opiates), gastric and neurological tumors were all examples of cases which could wait a few days while the patient or surgeon traveled.

The impact of the railroads on life in the Midwest was profound and extensive. Railroads played vital roles in attracting immigrants to settle the region. In many areas, towns were organized in a mercantile hierarchy—small communities could provide for the immediate needs of the farmers and had very small resident populations. These communities usually were supported with banking services and other less routinely needed mercantile services from larger towns. Sometimes these small farming communities had resident general practitioners, but more frequently doctors would settle in the towns which supported several farming communities and numerous outlying farms, all connected by rail.³¹ Even when a particular settlement predated railroad planning, as it had in the Old Northwest states, the combinations of geography, competition and mercantile needs had regularized trade patterns along similar lines.³²

Communication between agricultural communities and the larger world took place by means of the railroad. Trains brought mail, newspapers and supplies. Agents and employees of the railroad were the purveyors of gossip. The ritual of awaiting the train brought members of the community together. Although rails were not the only link with the larger world, nor was the station or store serving as a depot the only community building agency in the town, the railroad and its people formed a vital link.³³

There was yet another way in which the railroad was crucial to the development of population patterns in the Midwest—it shaped migration. Such migration, variously interpreted by historians, produced real instability in the smallest agricultural communities. The people who failed financially or saw greater scope for personal development typically moved along the railroad line to larger population centers. Like merchants, practitioners tended to settle



Early view of St. Mary's Hospital in Rochester, Minnesota. (Photo courtesy of Mayo Foundation.)

in larger railroad towns and develop a patient population from among the region's settlers.³⁴ As new physicians tried to move into these communities, they found it a more difficult than their predecessors had in developing a practice. Consequently, these practitioners typically moved further along the rails where prospects were presumed better.

Although William Mayo, Sr. had moved frequently in the development of his practice, he was a stable and successful practitioner by the time his sons returned home to join him. His role as a local booster for the city of Rochester and his service as a physician led to his family's benefiting from the railroad's impact on Midwestern life. Railroad people told of the Mayos' skill and success, while people who moved further West remembered the Mayos and returned to be treated by physicians they knew and respected rather than the more recently established or less well known practitioners nearer to them. This fact was particularly evident in the very serious situation where surgical intervention was the desired therapy. Thus the younger Mayos had the opportunity, based largely on the reputation of their father and the settlement pattern inspired by Midwestern railroads, to develop into surgical consultants outside a city environment.³⁵

The Mayos were fortunate in that their father had cooperated in the foundation of St. Mary's Hospital in Rochester. In return for the senior Mayo's early support, the nursing sisters closed the hospital staff to other physicians performing surgery. As the new speciality was beginning to achieve independent professional standing, public recognition and the reputations of the Mayos as surgeons grew locally, especially as a result of the senior Mayo's referral practice in gynecological surgery. Their reputations grew also as a result of the active participation of the younger Mayos in medical and surgical associations and by their steady stream of publications on surgical achievements.

If a rural practitioner had read a paper by the Mayos in his journals, he was increasingly likely to call on them as surgical consultants. For this reason, the operating room at St. Mary's was used with greater and greater frequency in the early 1890s. By the 1890s surgery was growing so rapidly it was virtually impossible to keep pace with new advances, not to mention recent developments in internal medicine and pathology.

Indicative of the breakdown in the ability of one man to keep pace with medical science was the response of Samuel W. Gross to Harold Ernst's bacteriological presentation on traumatic infections at the American Surgical Association meeting in 1883. The inference was that since no surgeon present could comment on the increasingly sophisticated scientific content, he should simply use the expertise Ernst represented. Finally, there was the subtle question of aptitude. William and Charles Mayo were not just trained as surgeons; they were in some real sense born surgeons.

When their father retired in 1892, the Mayo brothers decided to associate with an outsider in order to relieve the pressure his retirement placed on the general practice. They chose Dr. Augustus Stinchfield, a well-established local physician who did only office or minor surgical procedures. In 1895 Christopher Graham, their brother-in-law, joined the partnership. Graham did not have a particular aptitude for surgery and slowly he too became a full-time general practitioner and diagnostic consultant for the Mayos. By 1900 an informal group practice had developed, as much by chance solutions to immediate needs as by design.

In 1901 design took the upper hand. Henry S. Plummer joined the group that year as a full-time internist with the special interest in hematology. In addition to his diagnostic skill, for which he was hired, Plummer possessed an organizational ability second to none. As a result, he is generally recognized as the clinical force behind the development of private group practice in the twentieth century. In 1903 E. Starr Judd, who had interned at St. Mary's in 1902, was hired to expand the surgical staff, since the number of surgical cases had begun to exceed the capacity of the Mayo brothers. In 1905 the group saw over 10,000 patients and did 4,000 operations. Dr. Judd had proved his worth and Dr. Plummer was indispensable; so in 1906 both were added to full partnership.

Plummer's skill with the microscope and the steady advance of surgical pathology convinced the Mayos that a full-time pathologist would be a valuable addition to the practice. Consequently, in 1905 the Mayo brothers hired Louis B. Wilson from the University of Minnesota Medical School and Minnesota Department of Health. Wilson's contributions were strongest in the areas of pathological and surgical diagnosis and research, and his novel techniques for laboratory use readily proved their



The original Mayo Clinic building. (Photo courtesy of Mayo Foundation.)

intrinsic value. In a small room adjacent to the operating rooms at St. Mary's Hospital, Wilson provided microscopic diagnosis for the surgeons during operations. The story is told that one winter Wilson placed a tissue section outside the laboratory window and obtained an excellent frozen section, better than any previously developed, and thus was inspired to continue research on ways to improve laboratory methods for surgical pathology. Wilson's success, with Plummer's support, resulted in a rapid expansion of diagnostic pathology at Rochester. In 1906 Herbert Giffin was hired in medical diagnosis and in January of 1907 William MacCarty was hired to relieve Wilson in routine surgical pathology. Both young men were recent graduates of the Johns Hopkins University School of Medicine.

Although the composition of the group would change, the nature of the practice would vary, and the reorganization as the Mayo Clinic in the second decade of the twentieth century would all have an impact, the basic format had been established already. As surgeons able and willing to devote themselves full time to the new scientific surgery emerged in the late nineteenth century, they needed other physicians to relieve them of the other work associated with general practice. They needed referrals from outside physicians of surgical patients beyond the skill of generalists, they had an increasing need for the diagnostic acumen of other clinicians, and they needed the support of emerging diagnostic laboratories. All of these ingredients had long been associated in medical schools of the German universities and had emerged in U.S. cities as the urban, university-centered medical schools emerged. There were informal associations of internists, general practitioners, and surgeons in many American cities. Some of these associations were unethical, if not criminal, and led to fee splitting and conspiracies, but others, clearly the vast majority, were simply based on physical proximity and mutual professional respect. The Mayos seem to have been the first to realize the need for formal partnerships between specialists. They were certainly the most influential and successful in establishing the group practice ideal, but the idea was not unique to them. Indeed, group practice emerged almost simultaneously throughout the Midwest.

There are two Midwestern clinics with striking similarity to the Mayo experience, although they did not achieve success on the scale of the Mayos. When George Weber, an 1890 graduate of the

Missouri Medical College, set up practice in the small southern Illinois railroad town of Olney, his business grew so rapidly that he invited his brothers to join him. One of these brothers had studied surgery at Johns Hopkins and the other brother preferred internal medicine. In 1898 the Webers bought an old hotel to convert into a group-controlled hospital and sanitarium. Although the clinic grew slowly earlier in the twentieth century, today it operates as a multi-specialty group practice serving a wide area of southern Illinois.³⁶

In Evansville, Indiana, there is also a multi-specialty group practice called the Welborn Clinic, which had its origins in the 1890s when Dr. Edwin Walker joined his uncle, George B. Walker, in practice. After studying in Europe, Edwin Walker organized a private surgical hospital and sanitarium with A.M. Owen of Evansville. Dr. James Welborn, a cousin of Walker's, joined the group in 1898, and in the twentieth century it expanded and prospered under his dynamic leadership.³⁷

All three 1890s Midwestern groups have similarities. All three developed in locations well served by railroads, thus providing the impetus for expanding the areas of their practices. They were often initiated by family groups, at least some of the members had better-than-average training (usually through travel), and most importantly, the group invariably had been built around a surgical practice in hospitals controlled by the surgeons.

While having little effect on national mortality statistics, the emergence of effective surgical therapy had a profound social impact. Although such an impact is difficult to measure, the importance of surgical intervention in disease was profound. Most people knew someone, family or friend, who had had appendicitis. They knew people in the previous generation who usually had died in pain from peritonitis. With the advent of the new surgery, many patients made a complete recovery. Similarly, goiter had been a common malady throughout the Midwest, considered one of the world's goiter belts. Goiter was not a great medical problem in terms of national mortality statistics, but it was at best disfiguring and at worst led to death in severe cases. The experience of having friends or family members relieved by the new surgery must have had significant impact on the perspectives of farmers and tradesmen of Midwestern communities. A dramatic indication of



In 1926 Marshfield Clinic built its first structure on Seventh Street. Three of the Clinic physicians posed with their cars. (Photo courtesy of Marshfield Clinic.)

social impact can be found in the letter written to Kansas City surgeon Emory Lanphear by a mother of a charity patient five months after a cerebral operation.

Henry seems altogether different. He has lost the restless way he had before the operation. . . . His flesh is firmer and more solid. . . . He gets amused with play things and seems to enjoy himself. . . . It seems to be a miracle the way he has improved so everybody says who sees him. . . . I can say God bless you, and hope that someday we can send you money.³⁸

Although such experiences are difficult to evaluate, they clearly suggest profound changes in the public perception of surgeons. In 1900 the only group successful enough to be known beyond a regional service area was the Rochester group led by the Drs. Mayo, but the importance of surgery and surgery in medicine was growing.

The fame of the Mayo-led group resulted in deliberate imitations in other locations. The earliest imitators, like the other Midwestern group practices mentioned, were slowly emerging partnerships. Dr. Eric P. Quain graduated from the University of Minnesota Medical School in 1898 and after his internship moved to Bismarck, North Dakota, to establish a practice. In 1900 he invited another Minnesota graduate, Niles O. Ramstad, to come to Bismarck and take over Quain's practice while the senior man went to Vienna for further surgical training. In 1902 the two young practitioners established a partnership and were joined briefly by another Minnesota trained physician, Victor La Rose, who increasingly specialized in urological surgery. They were joined in 1907 by Dr. Albert Brandt, whose primary interests were in obstetrics and pediatrics, and in 1909 by Frederick Griebenon, a dermatologist. In 1910 Dr. William Bodensstab, an internist, and Ernest Rayder, a pathologist, were added to the group. Back in 1907 the Quain and Ramstad group contributed to the hospital building fund and until 1951 held all staff appointments at the Bismarck Evangelical Hospital.³⁹ Bismarck was a regional center for railroad traffic and mercantile support of the agricultural towns of the state.

In 1915 in Marshfield, Wisconsin, the idea of a group practice to be created by the association of physicians with already established

private practices was advocated for possibly the first time. Marshfield, like Rochester, Minnesota, was a railroad hub. Dr. K. W. Doege, a successful surgeon with two years of German postgraduate training, invited five successful local colleagues to consider joining with him in the creation of a group practice. Although it required a private bill of the Wisconsin legislature for the physicians to incorporate, the necessary legislation was obtained and in 1916 the Marshfield Clinic was established. In addition to Dr. Doege, there was Dr. H. H. Milbee, a Canadian trained surgeon who had been practicing in Marshfield for fifteen years; Dr. Victor Mason, a Canadian and European trained general practitioner who preferred internal medicine; Dr. William Hipke, who had specialty training from Europe in ophthalmology and otolaryngology; Dr. Roy Potter, who became the group's radiologist, and Dr. Walter G. Sexton, who studied with Hugh Young at Johns Hopkins and came to specialize in urology.⁴⁰

Although the deliberate formation of groups to improve the quality of practice and facilitate specialization began before World War I, the trend was greatly accelerated by the war experience. Many American physicians found the reality of having a variety of expert colleagues available for consultation a benefit to themselves and to their patients. Furthermore, the fears of competition, either financial or intellectual, were greatly reduced. After the war, the experience of George Crile and his Cleveland colleagues was typical, if more famous, because of the success of the resulting Cleveland Clinic.

George Crile had entered practice after medical school as an assistant to his former professor of surgery, Dr. Frank C. Weed. After Weed's death Crile joined forces with another office assistant, Dr. Frank Bunts, to share office expenses. Each preserved his own private practice, however. As the Bunts and Crile office was expanded, in 1892 they took in young W. E. "Ed" Lower, who in 1895 was made a partner, sharing expenses and office income. Again each physician kept private patients accounts independently. In 1901, when Crile was asked to join the staff of the Lakeside Hospital in Cleveland, one of the conditions for his hire was that he give up his other hospital affiliations. He did so and his skill and fame brought increased surgical responsibilities. He had common interest with Dr. Edward Cushing, an internist on the Lakeside staff, and they developed a repeating pattern of



Dr. Frank E. Bunts



Dr. George W. Crile



Dr. William F. Tower



Dr. John Phillips

The four founders of the Cleveland Clinic. (Photo courtesy of Cleveland Clinic Archives.)

interstaff consultation in both research and practice. During the war Crile developed the Lakeside Hospital Unit, which included in addition to several general surgeons, an orthopedic surgeon, pathologists, internists, neurologists, dentists, a genito-urinary surgeon and radiologists. After the war the collaborative spirit of work in common association showed Crile the way to deepen the shared office experience into a group practice. He recalled in his autobiography:

Having been all of our professional lives associates in practice and in teaching, having collaborated in the organization of hospitals and I, having been engaged in medical research in laboratories established by myself, it was but natural that while serving together at the British Army Base in Rouen, Bunts, Ed Lower and I should become convinced of the singular advantage which accrues to the patient who is in a hospital in which he commands the services of the internist, the surgeon, the specialist, the X-ray department, the pathologist and the bacteriologist, a continually active ensemble of doctor, nurse, and scientist. The innumerable staff conferences, the circulation of ideas, the inflow of new knowledge to every member of the staff, seemed to us an ideal setup for the most altruistic and the most effective way of practicing a great profession. Thus it was that the walks and discussions of ideals, stimulated by the roar of the cannon, the uncertainty as to the outcome of the war and of life itself, formed the background for the organization of the Cleveland Clinic.⁴¹

The problems of organizing such a group within Lakeside Hospital and Western Reserve proved insuperable and so the three long time associates, Bunts, Crile and Lower, joined with Dr. John Phillips, a local internist, to establish a private clinic and hospital with an associated research and graduate teaching unit. On February 26, 1921, the Cleveland Clinic opened with a dedicatory address by Dr. William Mayo. That Mayo was invited to open the Cleveland Clinic was indicative of his friendship with Crile and his position in American medicine and surgery, but it also reflected the very real fact that his and Charles Mayo's inspiration had transformed the



Consulting offices of Doctors Bunts, Crile and Lower before the formation of the Cleveland Clinic Foundation (views 1, 2 and 3), and the original Clinic building (view 4). (Photo courtesy of Cleveland Clinic Archives.)

practice of medicine. Again, Crile's words are noteworthy on this occasion:

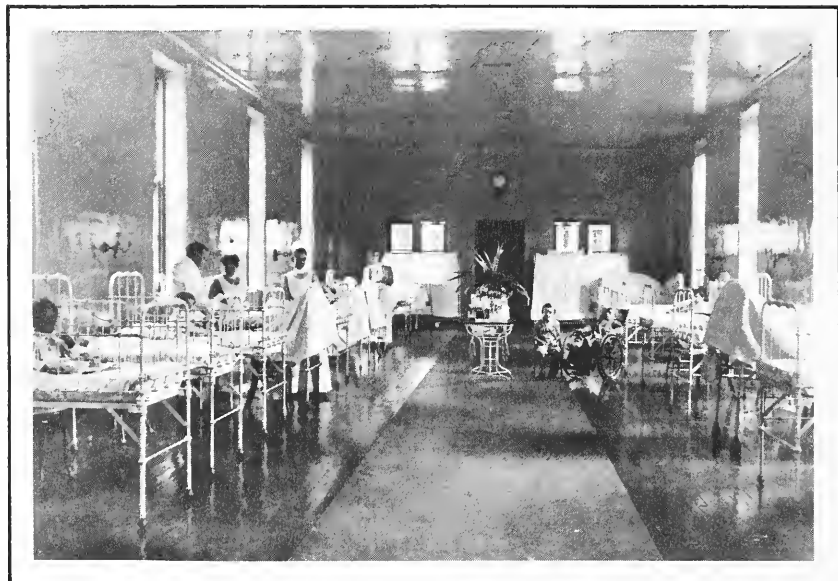
They were among the first to recognize the obvious fact that medical science was outstripping medical practice and, unlike others, they adapted their organization in harmony with this trend and formed an organization on the scale of a medical school to promote both medical science and the practice of medicine. Their conspicuous leadership in this practical adaptation gave strong impetus to group practice in medicine.⁴²

The Cleveland Clinic stands as an example for the new urban group practice. Crile had been part of the association of urban physicians who consulted one with another and had been part of a university medical community but came, as did many of his colleagues around the country, to see that the group practice was something more than such association. By the 1920s, the group practice had moved from support of rural populations to become an acceptable mode of practice in cities, more specialties were represented and internal medicine was gaining new therapies through physiological and biochemical research.

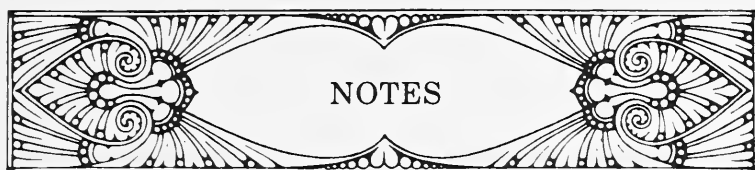
There were many forces which shaped individual groups, but there is no question that group practice was a Midwestern phenomenon. The wealth of the Midwest was important and so the practice of good men could be supported by the population. The pattern of settlement and trade, and consequently, the pattern of medical practice and referral, to a large measure was driven by developments in the American railroad industry. Without doubt, this industry had its earliest, greatest and most complete impact on the Midwest. But the central feature of the group practice, indeed the *sine qua non*, remained the possibilities of the new surgery of the late nineteenth and early twentieth century and the need of surgeons for a variety of supporting physicians to supplement the pre- and postoperative care of their patients.



Surgery at the Huron Road Hospital in 1892. Shown in this photo from left to right are: C.H. Cushing, H.F. Biggar, C.H. Rust, W.E. Pryor and G.B. Haggart. The nurses are unidentified. (Photo courtesy of the Historical Division of the Cleveland Health Sciences Library.)



A view of the Children's Hospital Ward at Lakeside Hospital. (Photo from the 1905 Lakeside Hospital Scrapbook of Dr. George Crile, courtesy of Cleveland Clinic Archives.)



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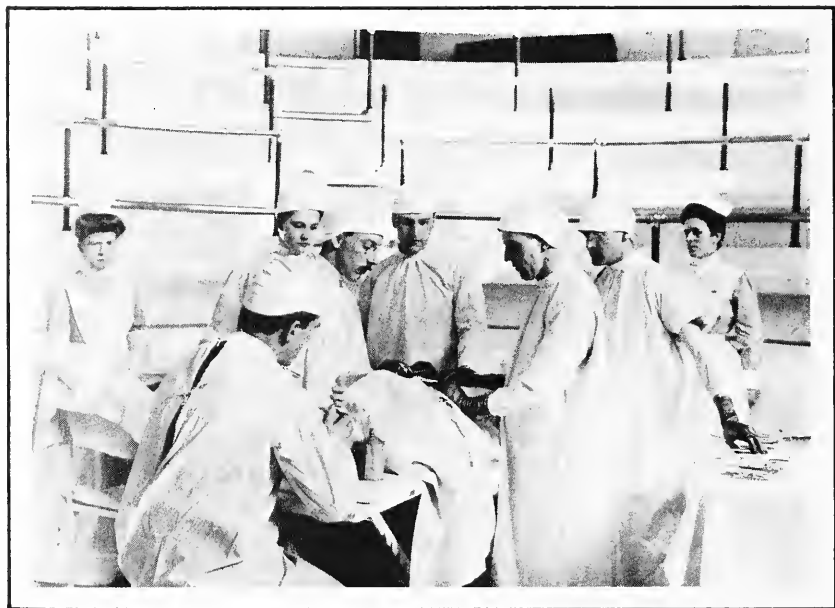
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Typical surgical operation showing the development of aseptic techniques at Lakeside Hospital. From left to right are Doctors Peterka, Elliott, Hoskins, Ludlow and Burroughs. The nurses are unidentified. (Photo from the 1905 Lakeside Hospital Scrapbook of Dr. George Crile, courtesy of Cleveland Clinic Archives.)



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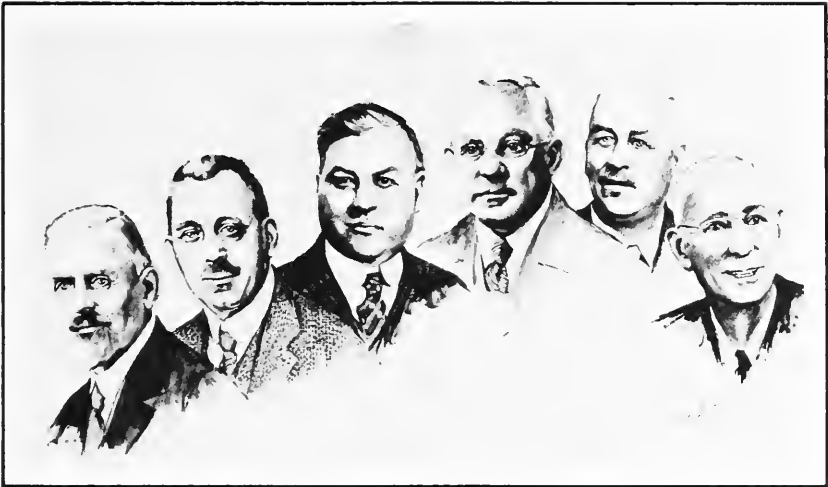


Medical History in the Making: Marshfield Clinic's Commitment to Rural Medical Care

Often overlooked in evaluations of the urban advantages of America's foremost group clinics is the high quality of medical care the staff of Wisconsin's Marshfield Clinic provides in a decidedly rural setting. In fact, Marshfield Clinic's substantive contributions over the last one hundred years are all the more noteworthy given its unique position and relative isolation in America's heartland. Located in the rolling farmland of central Wisconsin, Marshfield Clinic has the distinction of being the largest rural clinic in the country. In addition, it serves as one of the five largest private group practice clinics nationwide. A town of only about 20,000 inhabitants, Marshfield has about 4,000 health care delivery employees—almost half of the town's industrial work force. The clinic itself and the associated Marshfield Medical Research Foundation employ over 1,470 people, including more than 230 physicians representing 55 specialties and subspecialties. (By comparison, Mayo Clinic in Rochester is the largest clinic in the nation with 830 physicians.) On the average working day, over 2,000 patients visit the Marshfield Clinic and its eight satellite clinics in central and northern Wisconsin.

Founded in 1872 by John Marsh, Marshfield began as a small logging town for Wisconsin's fledgling timber industry. Gradually, as lumber interests gave way to a more diversified economy, the newly timbered land proved to be excellent for agriculture. Marshfield today serves as the hub of a three-country region in Wisconsin's all-important dairy industry. The needs of farmers play a large role in the commerce and manufacturing of the community.

In 1915 Marshfield was important mainly as a railroad center. The role of medicine in the town's history did not begin until Dr. K. W. Doege, a successful surgeon with two years of additional training in Germany, decided to form a group practice. This idea was novel



Marshfield Clinic's six founding physicians included Drs. William Hipke, K.W. Doege, Victor Mason, Walter Sexton, H.H. Milbee and Roy Potter. (Portrait by Shirley Thompson, courtesy of Marshfield Clinic.)

at the time even in more established population centers, and Doege's determination to set up a group of specialists agreeing to practice together to pool their resources was all the more remarkable in the conservative farmland of central Wisconsin. He did his best to recruit both local and nationally known physicians for his pioneer venture. In addition to Dr. Doege, there was Dr. H. H. Milbee, a local surgeon who had received his training in Canada; Dr. Victor Mason, a Canadian- and European-trained general practitioner interested in internal medicine; Dr. William Hipke, specializing in ophthalmology and otolaryngology; Dr. Roy Potter, covering the group's radiological needs; and Dr. Walter G. Sexton, specializing in urology.

Marshfield Clinic's organizational structure is unique for a large medical institution. Each physician pays \$1,000 for a share of stock in the clinic and serves as a voting member of the board of directors. This single share of stock allotted to each physician does not accrue value or pay dividends. Instead, it serves as a kind of honorary membership which is sold back to the corporation when a physician leaves.

Marshfield Clinic's founders developed a salary line equal for all specialties, an innovation which continues in a modified form today. After a tenure of five years, a physician originally earned top salary. No advantage was allowed for seniority—indeed, the original plan called for a reduction in salary from age 62 to 65, when retirement was expected. In this way, Marshfield's founders tried to assure that the institution would never become an "old man's clinic" or an organization run on the basis of seniority.

A strong internal medicine department was to provide the backbone of Marshfield Clinic. Realizing that not all physicians would be eager to accept such an egalitarian system, the clinic administrators nevertheless feel positive about their approach. William J. Maurer, M.D., who served a long tenure as president of the clinic, sums up the professional advantages thusly: "We are looking for the one physician in four who might find the Marshfield Clinic attractive because of its lack of emphasis on traditional physician reimbursement patterns and its heavy commitments to the group practice concept, to developing a clinic with the finest physical facilities and equipment, and to research and education."¹



By 1916 Marshfield Clinic quarters had been moved to the second floor of a store on Central Avenue. Here the six physician founders practiced together. (Photo courtesy of Marshfield Clinic.)

In the past few years, notes Maurer, the salary system has had to be revamped to some degree so as to conform to ranges in place at other large clinics. What has not changed, however, has been the unique nature of Marshfield Clinic's cooperative form of management. An Executive Committee still meets weekly "to do the homework of managing the clinic and to make recommendations to the Board, but the important decisions are made by the entire Board of Directors at a monthly town meeting with each physician-shareholder having one vote."²

As Maurer explains, Marshfield is the clinic that no one owns. That is, the clinic is owned and operated by its physicians, who hire administrators to facilitate and do the management tasks that need doing. The physician-owners, however, do not develop equity in either the clinic or its buildings. "Rather, these are held in trust, similar to, for example, a Catholic hospital that is owned by the sisters but in which any individual sister does not have true equity and cannot sell her share."

Marshfield Clinic has followed that tradition of innovation, from health care delivery to health care financing. The Greater Marshfield Community Health Plan, a prepaid health insurance program, was introduced in 1971, years before the invention of health maintenance organizations (HMOs).

Greater Marshfield, the nation's first and now largest rural HMO, now covers all or parts of 14 counties in central and western Wisconsin and covers almost 70,000 people. The health plan is available to anyone in the area—from large industries to farm families. Because of its medical expertise and the availability of a supplemental health plan for those over 65, some believe the plan has been a magnet to draw a higher than normal percentage of people over 65 to Marshfield.

In addition, a federal program administered by the research component of the Clinic—Marshfield Medical Research Foundation—makes comprehensive health care insurance available to families with limited incomes. Begun in 1974, the program includes about 4,000 individuals.

The particular health needs of farmers and others living in rural areas are the focus of another innovative program. The National

Farm Medicine Center operates under the auspices of Marshfield Medical Research Foundation and Marshfield Clinic. Long a leader in farm-related medical research, the National Farm Medicine Center has addressed a more immediate farm crisis caused by the stress of financial instability.

This year the Farm Center co-sponsored the Farm Stress Management Workshop with the assistance of Dr. Jerry Robinson, a professor of rural sociology at the University of Illinois. Dr. Robinson advised the farmers and farm couples who attended the workshop to write themselves behavioral prescriptions for improving their situation. "When things are not going well, there is a tendency to work, work, work. You can work yourself into bankruptcy or a heart attack,"³ he warned.

The financial risks farmers take have been well documented. With the help of Marshfield Medical Research Foundation and the National Farm Medicine Center, the health risks in agriculture are beginning to be recognized as well.

There is a prevailing and often mythical view of farm families living the good, healthy life in the country. The Foundation has provided important epidemiological research in agriculture, dating to its research on farmer's lung disease more than two decades ago. Through mass screening of farmers, researchers were able to identify the organism causing farmers' lung and create a protocol to prevent this serious respiratory condition. Researchers recommended that farmers who work around moldy forage wear adequate respiratory protection, such as masks, to screen even small particles. Also they stressed adequate air flow, reduced storage time for forage, and storing hay in silos rather than in bales, all in an effort to keep hay moist and free of mold.

Other issues being addressed by the Foundation's researchers and the National Farm Medicine Center are milker's knee, an arthritis caused by years of bending and squatting; skin problems associated with exposure to sun; harsh chemicals used in milk production; herbicides and pesticides; specific cancers with a higher incidence for farmers; and accidents. Early findings of a four-year hearing study indicate that high school students on farms often have significant hearing losses by the time they reach their teens.



Marshfield Clinic's first building was constructed in 1926. (Photo courtesy of Marshfield Clinic.)

The Regional Services program is an integral part of the health care delivery system at Marshfield Clinic. The Department of Regional Services was formally established in 1972. Its purpose was to develop a rural health network, a decentralized system in which first-rate primary care would be available locally and then integrated into a regional system of backup, secondary and tertiary care. Development of this network included planning, development and operation of a rural health care delivery system that provides linkages to communities, to existing medical institutions, and to physicians seeking those elements of a medical resource center most appropriate to meet their needs. The program offers diagnostic and technological services, consultation services for medical and administrative problems, and continuing educational programs for physicians in rural practices.

Computerized services, telecommunications and transportation systems have been instrumental in the development of this network. An interfacing of these Marshfield Clinic systems has resulted in "one-stop shopping center" availability for a variety of diagnostic and consultative services, which are currently being provided to 350 different clinics and hospitals throughout northern and central Wisconsin. Services provided include twenty-four-hour EKG interpretation via computer, mobile echocardiography, lab services, CT head and body scans, pulmonary function, and numerous other diagnostic procedures. Thirty-five physician specialists provide on-site consultation at ten different locations. On-site and video outreach medical education programs compliment those available at the central facility. Last year 127 CME programs were presented at fifty different sites. Video tapes were provided on a contractual basis to fifty different participants.

This network of support services provided the framework for the eventual development of nine Marshfield Clinic primary care satellite centers. The population of these communities varies from 1,000 to 3,500 and the distance from Marshfield ranges from 10 to 100 miles.

Factors considered in evaluating potential sites for satellite centers include existing health care manpower and facilities, the economic profile of the community, demographic factors, financial considerations, satellite acceptance and HMO expansion potential. From the perspective of the physician considering practice in a

rural area, the satellite concept is attractive because this linkage with combined resources can more effectively affect problems associated with rural health care practice. Those problems include unavailable peer coverage, absence of consultation, unavailability of trained administrative and technical support personnel, economic constraints, opposition by existing providers, professional isolation and quality control.

The Marshfield Clinic buildings adjoin the new St. Joseph's Hospital. There has long been a strong interdependent relationship between these two institutions. They share doctors, medical records, a cardiac catheterization laboratory and a large testing lab. Both use the clinic's radiation therapy facilities and dietetic services. Administrators at both institutions worked together to set up the HMO program.

Marshfield Clinic's and St. Joseph's staff have shared professional education programs since 1916. When the University of Wisconsin joined forces with these two Marshfield institutions in 1972, graduate training programs were enhanced and enlarged. Since then Marshfield staff have come to benefit from cooperative programs with Milwaukee's Medical College of Wisconsin, Iowa City's University of Iowa College of Medicine and Minneapolis' University of Minnesota Medical School.

In 1947 renowned dermatologist Stephan Epstein, M.D. had put Marshfield Clinic on the road to important research. He was one driving force behind the formation of the distinctive Marshfield Medical Foundation in 1959. Since that time Foundation programs have had continuous financial support from the clinic physicians, NIH grants and the U.S. Public Health service—as well as a large measure of support from the general public locally.

The level of sophisticated care provided today for both urban and rural dwellers at Marshfield Clinic is commendable especially in light of its fascinating past—as an institution which has evolved from a pioneering endeavor of six visionaries with the courage to take on the unique problems of group practice in a rural atmosphere.



NOTES

1. William J. Maurer, M.D., "For the One Physician in Four: Marshfield Clinic's Novel Approach to Group Practice," *Postgraduate Medicine* 79 (May 1986): p. 14.

2. *Ibid.*

3. This remark was made by Jerry Robinson, Ph.D. during the 1986 Farm Stress Management Workshop at Marshfield Clinic. Text provided courtesy of Marshfield Clinic's Marketing/Communications staff.



In 1975 Marshfield Clinic (far left) added a new structure adjacent to St. Joseph's Hospital. A further addition dedicated in 1984 made possible the current staff of 250 physicians and over 1,400 support personnel. (Photo courtesy of Marshfield Clinic.)



UMI ANNOUNCES NEW SOURCES FOR HISTORY OF PHARMACY

The University of Michigan Research Collections staff announces the upcoming release of new material in the health sciences entitled "Primary Sources for the History of Pharmacy in the United States." This novel collection, which will be available in November of 1986, is currently being filmed at the University of Wisconsin and the National Library of Medicine in collaboration with the American Institute of the History of Pharmacy. The microform collection will contain approximately 500 microfiche, including 90 titles presenting a selection of primary sources for a study of pharmacy in the United States from 1775 through 1940. The set contains books on pharmaceutical law, treatises, lectures and textbooks. Wholesale drug catalogs and formula books will provide pharmacy students, researchers and historians with a unique history of the practical application of pharmacy from the past. Individual titles will be made available in 1987.

An annotated bibliography to support the microfiche collection as its official finding guide is being prepared by the American Institute of the History of Pharmacy. This bibliography, which is being authored by Dr. Nydia M. King, will be available through the Institute in November.

For those interested in purchasing the new collection before December 15, 1986, UMI is offering a special pre-publication price of \$1,195 in total. Contact UMI Research Collections at (800) 423-6108 for further information.



ST. LOUIS SPONSORS EXHIBIT ON WOMEN PHYSICIANS IN HISTORY

The St. Louis Science Center announces a new exhibition on the social history of women physicians in America from 1835 through 1920. The exhibit, which is being circulated by the Association of Science-Technology Centers, is sponsored jointly by the Medical College of Pennsylvania, The New York Infirmary/Beekman Downtown Hospital, and New York University's Department of History. Entitled "Send Us a Lady Physician: Women Doctors in America, 1835-1920," the exhibit will open November 1 and run until January 4, 1987.

Sights and sounds of the Victorian era entice visitors through a "triumphal arch" into the display area. The exhibition presents the "typical" late nineteenth-century woman physician through the members of the class of 1879 of the Women's Medical College of Pennsylvania, the first "regular" medical school for women. Included are actual examinations, hospital records and photographs of medical equipment and practices common in the last century.

During the Victorian era, women practiced in all areas of medicine, but they concentrated their efforts on the care of women and children and preventative medicine. At the time, women physicians were viewed as nurturers and social healers. The question of why the number of women physicians declined in the late nineteenth century is also explored. Both women's achievements in medicine and the changing role of women in American society are examined.

For additional information, contact Polly Coxe at St. Louis Science Center at (314) 725-2888.

Visitors to the St. Louis Science Center's exhibition "Send Us a Lady Physician" may wish to complement their tours of this unique period in American history with a rereading of Jill Gates Smith's excellent essay "Women in Health Care Delivery: The Histories of Women, Medicine and Photography," which was featured in *CADUCEUS*, Winter, 1985 (Vol. I, No. 4).

ARCHIVISTS ATTEND WORKSHOP

The Society of American Archivists sponsored a special workshop titled "Starting an Archives" workshop, which ran from September 12 through 14 in Chevy Chase, Maryland. Among the topics presented were: What is an archival program and how to set one up; theories and principles of archival administration; and an overview of the basic techniques of archival work—including description, arrangement, acquisition and reference. Participants discussed such concerns as determining what resources are required to establish an archival program, budgetary considerations, public relations, staffing and working with committees.

For additional information, contact the Society of American Archivists, 600 S. Federal, Suite 504, Chicago, Illinois, 60605.

FILMS ON MEDICINE AND HEALTH SOUGHT

Martin Pernick of the University of Michigan at Ann Arbor is seeking information on motion pictures on medicine or health-related topics produced prior to 1928 for his upcoming book entitled "Bringing Medicine to the Masses." He is particularly interested in finding films made for lay audiences on such topics as hygiene, nutrition, tuberculosis, venereal disease, child care, eugenics, etc. Anyone who remembers seeing such films in school, in the army, or in theatres before 1928, and anyone who knows of specific references to such films in published or unpublished literature and documents from this period is requested to contact Professor Pernick in the Department of History at the University of Michigan at Ann Arbor (313) 764-6305.

ERRATA

Caduceus editors wish to inform our readership of a correction in a legend published in Christopher Hoolihan's essay on "The Bernard Becker, M.D. Collection in Ophthalmology," which appeared in the Autumn, 1985 issue. The plate which appeared on page 52 of the article should have read "Photogravure of epithelioma from Andrew Maitland Ramsay's *Atlas of External Diseases of the Eye*, New York, 1898," instead of "exophthalmic goiter."

CLEVELAND SPONSORS SLOAN LECTURE

The Historical Division of the Cleveland Health Sciences Library will present the 1986 Anton and Rose Zverina Lecture on Monday, November 10. Mr. Peter Jones, Fellow and Librarian of King's College Library in Cambridge, England will be the speaker. His topic will be "Sir Hans Sloan: the Colossus of Medical Collecting." Sloan's collection of books, manuscripts, herbaria, ethnographic specimens, and pictures became the foundation of the British Museum, the British Museum (Natural History), the Museum of Mankind, and the British Library. The collection of medieval medical manuscripts in the latter institution is one of the greatest in the world and will be a featured part of Mr. Jones' presentation.

HISTORIC PRESERVATION SUMMER WORKSHOP

The Campbell Center for Historic Preservation Studies hosted a summer workshop series in June and July. Among the topics covered were: Museum Collections (including textile conservation, computerization, document conservation and care of ceramics and glass); Architecture (listing in the National Register, rehabilitation of wooden structures, maintenance and repair of concrete structures); Furniture (conservation of historic finishes and "hands-on" furniture conservation); and Interdisciplinary Concerns (buildings and collections, and historic preservation—philosophy and practice).

Contact the Campbell Center for Historic Preservation Studies, P.O. Box 66, Mount Carroll, Illinois, 61053, or call (815) 244-1173.





WELLCOME INSTITUTE CELEBRATES
FIFTIETH ANNIVERSARY

The Wellcome Institute for the History of Medicine opened "A Vision of History" exhibit this fall to celebrate the fiftieth anniversary of the Wellcome Trust. This exhibit opened on September 1 and is scheduled to run through April 10, 1987 at the Euston Road building in London. For further information on the exhibit itself and on the special catalog published for the occasion, write to the Wellcome Institute for the History of Medicine, 183 Euston Road, London NW1, England.



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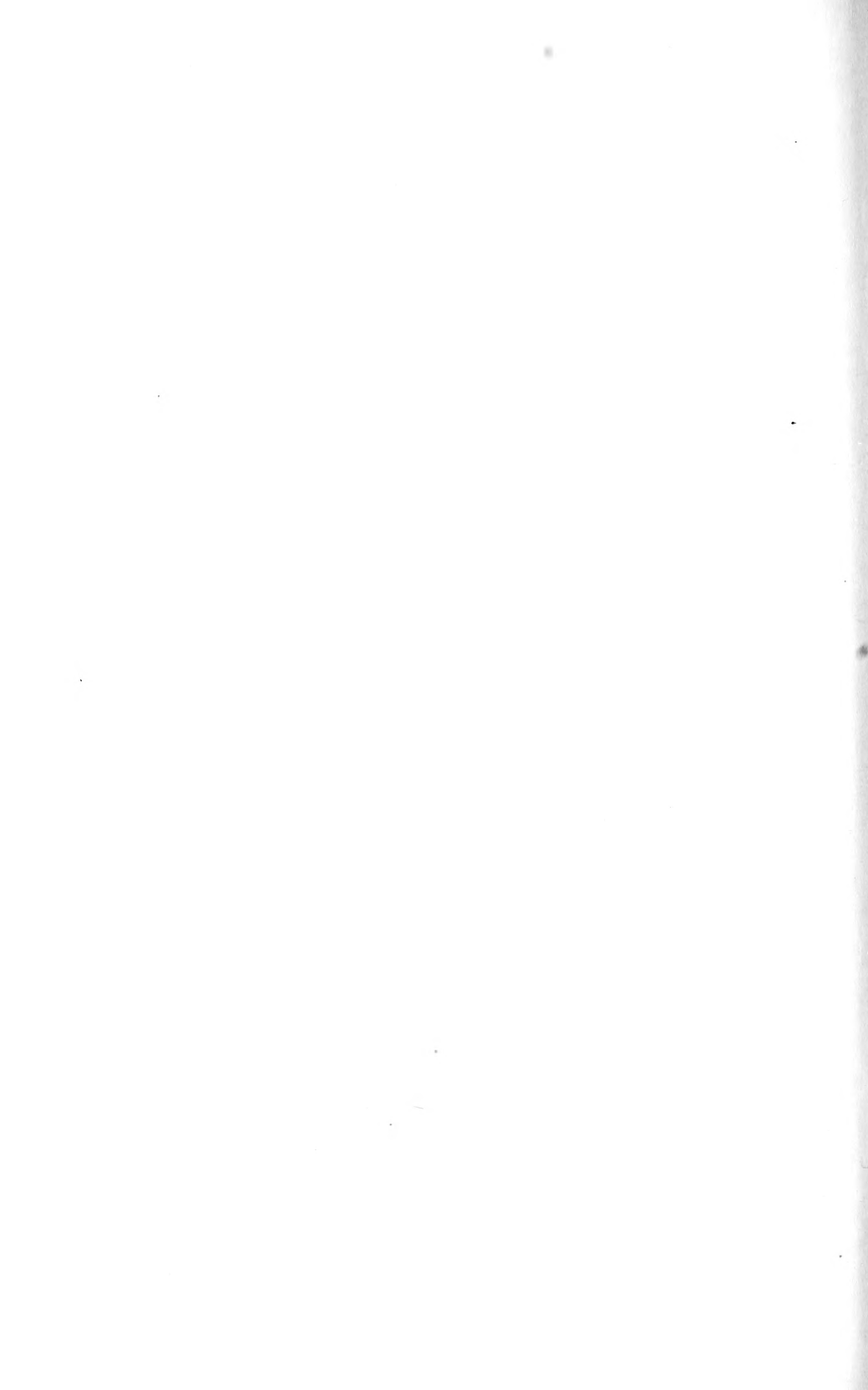
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**Produced for the Department of Medical Humanities,
Southern Illinois University School of Medicine by the
Division of Biomedical Communications, Illustration
Debra Vaninger, Design
Pat Baker, Typesetting**

